

regeln, actually lived on the plains under the Harz, Dr. Nehring has proved satisfactorily by his own researches. It follows that this country must have formed a steppe during a certain portion of the Diluvial period.

If the above conclusions are right it follows that in a former epoch those parts of Central Europe which were formerly covered by the sea generally became steppes before coming into their present condition. Perhaps the Magdeburg-Halberstadt steppe extended southwards over Aschersleben and Halle into the valley of the White Elster, for Prof. Liebe has found, near Gera, fossil remains of several specimens of the large Jerboa, as also of the Souslik and other animals which have been obtained at Westeregeln. Besides, remains of the same animals, as well as those of the Saiga antelope and wild ass, have been found at several other points to the west. It follows, therefore, that the steppe must have extended considerably in that direction.

The result of these investigations is the more important as manifest traces seem to show that at the Steppe period man had already occupied the plains of middle Europe, and occasionally took up his abode even on the ancient steppe of Westeregeln.

The cause of the disappearance of the ancient steppes of Central Europe Dr. Nehring supposes to have been the gradual increase of the forests which advanced along with the change of climate. In the Steppe period England and Scandinavia were still joined to the continent of Europe, the North Sea and the East Sea did not exist in their present extent, the Gulf Stream had a more northern direction, and the climate was drier and more severe than it now is. As the climate softened and the forests advanced from the wooded hills, the steppe animals gradually withdrew themselves towards the east, and disappeared, leaving only fossil remains to attest their former abundance.

THE COLORADO BEETLE

WE have already several times referred to this destructive insect, and now that it has reached Europe we give an illustration of the creature in its various conditions, along with some notes which have been forwarded to us by Mr. Andrew Murray. The Board of Trade have reissued the circular, with a coloured illustration, referred to in our article on Our Insect Foes, vol. xv., p. 85.

The Colorado beetle belongs to that subdivision of vegetable-feeding species known as Phytophaga. It may help the general reader to an appreciation of their place and character if we mention the Turnip flea as a British species of this section, and still nearer to it those brilliant green little gems that are to be seen in quantity on the leaves of the white nettle (*Lamium album*) in summer, and which in Scotland bear the colloquial name of Virgin Maries, an appellation, however, which is also there sometimes indifferently given to the ladybird. The genus in this great section to which these little insects equally with the Colorado beetle belong is named *Chrysomela*. It is true that its first describer, Say, named it *Doryphora decemlineata*, and that at first that designation acquired such extensive currency that it was all but universally adopted; and many people from old habit or deference to general usage, even when they know it to be an error, still use it; but all entomologists know that it is not a *Doryphora*, but a portion of the great genus *Chrysomela*, without going into other details. The difference between them can be very easily pointed out by one single character. *Doryphora* is a massive *Chrysomela* with a strong spike projecting forwards from the middle (the mesosternum) of the under side, while *Chrysomela* has no such spike. The former is a genus peculiar to the South American region, including Central America, and contains the largest, finest, and most beautiful species of the family. Some of them are somewhat similarly

marked to the Colorado beetle, which no doubt led to Say mistaking the genus. But although the Colorado species and its allies are clearly enough *Chrysomelæ*, systematists in arranging that genus have broken it up into several sub-genera or new genera, and the latest authority (Chapuis) has placed them in a genus named *Leptinotarsa*, but at the same time indicates his opinion that a further subdivision must take place, which will leave the Colorado beetle and its relations in a sub-genus by themselves, as was long ago (1837) proposed by M. Chevrolat, under the name of *Polygramma*. For the characters of these subdivisions we refer to M. Chapuis's genera, and for the specific characters of the species falling under *Polygramma* to Stahl's diagnosis and Mr. Riley's first



Potato leaf with eggs of Colorado Beetle on under side.



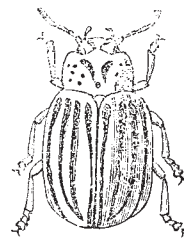
Larva of Colorado Beetle; natural size. —NOTE. The double row of black spots along the abdomen is not sufficiently distinct in this cut.



Pupa of Colorado Beetle; natural size.



Colorado Beetle; natural size.



Magnified Sketch of Colorado Beetle.

Missouri Report (1869). These are, first, the true *Polygramma* (*Decemlineata*, Say) that has occasioned all this alarm, which is the most northerly species, its native home being the eastern base of the Rocky Mountains and the prairies extending eastward. Next a variety called *Multilineata* by Walsh and Stahl, but which is not specifically distinct. Then a good species, *Polygramma juncta*, which ranges through the Confederate States of North America, and is easily recognised by two of the dorsal black lines uniting to make one thicker one. Farther to the south, about Vera Cruz and Costa Rica, &c., there is another species very like the Colorado species, called *Polygramma undecemlineata*, Stahl, and which is found in enormous numbers in these parts of Mexico. Lastly Stahl records another, which we have not seen, from Mexico, under the name of *novemlineata*. All these feed on different plants, although probably plants all belonging to the same order, the Solanaceæ.

NOTES

THE Society of Arts has awarded its Albert Medal "for distinguished merit in promoting Arts, Manufactures, or Commerce, to Jean Baptiste Dumas, member of the Institute of France, the distinguished chemist, whose researches have exercised a very material influence on the advancement of the Industrial Arts." The Society's Medals for papers read during the session, have been awarded to Prof. Barff, M.A., for his paper on "The Treatment of Iron for the Prevention of Corrosion;" J. Meyerstein, for his paper on "Stenochromy, a Novel Method of Printing in Colours;" A. J. Ellis, F.R.S., for his paper on "The Measurement and Settlement of Musical Pitch;" B. St. John Ackers, for his paper entitled "Deaf not Dumb;" Commander Cameron, R.N.,

C.B., for his paper on "The Trade of Central Africa, Present and Future;" James Irvine, for his paper on "Our Commercial Relations with West Africa, and their Effects on Civilisation;" Sir Douglas Forsyth, C.B., K.C.S.I., for his paper on "The Progress of Trade in Central Asia;" W. Thomson, for his paper on "The Sizing of Cotton Goods."

A CIRCULAR has been issued by Messrs. Rowe and Groser, the hon. secretaries of the British Association Reception Committee at Plymouth, giving some interesting information about that town. Appended to this is a useful table of the tourist fares to Plymouth from some of the principal stations in the kingdom. Besides Mr. Warington Smyth, Prof. Odling and Mr. Preece have been named as lecturers. One of the excursions is likely to be to Exeter; at least the inhabitants of that interesting city are taking active steps to bring this about. Those of the members who were at the Exeter meeting of 1869 have no doubt many pleasant memories of the visit. The fine museum, which was only completed in time for the reception of the Association, is now filled and admirably arranged under the guidance of Mr. W. S. M. D'Urban, F.L.S. The Dublin people have already begun to prepare for the meeting in that city in 1878. A meeting was held in the Mansion House the other day, under the presidency of the Lord Mayor, when it was announced that subscriptions had already been received to defray expenses. Dr. Ball is one of the hon. secretaries.

AT the conclusion of the last meeting of the Royal Astronomical Society, as we stated last week, a special meeting was held to consider a proposed alteration in the bye-laws. The following is a short account of the business transacted:—Before the last election of officers of the Society (in February) two or three of the fellows printed a balloting list of their own, and having circulated it amongst the fellows without any indication of its private origin, many of them used it as a polling paper at the election, under the impression that it had been issued by the Council. The election was also influenced in another way by the putting up for secretary the name of a fellow who had declined to serve. By these manoeuvres a curious anomaly in the bye-laws was made effective—so effective indeed that one member was elected to the council by a few votes, whilst another who had obtained a far larger number of votes was ruled not elected. With the view of avoiding such thwarting of the will of the society in future, the council appointed a committee to revise those of the bye-laws which bore upon the subject. The present special meeting was called to consider the proposed alterations, and they were now submitted for approval or rejection. An amendment, however, which was proposed by Lord Lindsay, the foreign secretary, was carried, deferring their consideration until after the next election of officers.

A VERY satisfactory Report by the Savilian Professor of Astronomy, Oxford, as Director of the University Observatory, has been made to the Board of Visitors for the year between June 1876 and June 1877. The instruments all seem to have worked well except the sun spectroscope, which became seriously deranged in the month of August last, and has not yet been reinstated. 426 photographs of the moon (making altogether, to this date, 652) have been taken with the De La Rue reflector during the year; of these by far the greater number appear to be suitable for micrometric measurement. This will be systematically applied so soon as the Observatory is in possession of the costly micrometer now in process of construction by Mr. Simms, and which is to be the gift of Dr. De La Rue to the Observatory. Then will commence the difficult but interesting research relative to the amount of the physical libration of the moon. 259 complete measures of 117 double stars have been taken during this year with the great equatorial. A second set of observations of six of the satellites of

Saturn has been completed. These comprise thirty measures of the co-ordinates of Titan, twenty of Rhea, fourteen of Iapetus, fourteen of Dione, twelve of Tethys, and two of Enceladus. The sun's chromosphere had been observed and delineated on twenty-two days. Eight measures of the difference of the R.A. of Venus and λ Geminorum, and seven of the difference of declination, were taken at the time of their conjunction. Preparations are being made for observations of the planet Mars at its approaching opposition, with a view to the determination of solar parallax. For this purpose the director has devised a new form of micrometer capable of measuring with the requisite exactness distances to the extent of forty minutes of arc. If this instrument, realises his expectations he thinks it may supersede Bessel's heliometer. It may properly be called a *duplex heliometer-eyepiece*. The director suggests the advisability of now printing the Proceedings of the Observatory.

A STATUE has been erected at Nancy by public subscription, to Mathieu de Dombosk, the creator of the Roville experimental farm, and one of the earliest scientific agriculturists of France. He was born at Nancy on July 30, 1777.

THE Prussian Government has ordered Berlin to be connected with Hamburg by a subterranean telegraph, in order to avoid perturbations during thunderstorms, which have been very frequent this spring. Similar measures will be adopted for other large towns in Germany.

M. GAUTHIER VILLARS has published in Paris a volume of logarithms, containing tables for all numbers from 0 to 434,000,000,000 with twelve decimals, by M. Namur, secretary of the École Moyenne of Thuin-on-Sambre (Belgium). This wonderful volume, selling at three francs, has been printed by order of the Royal Academy of Sciences of Belgium.

ON Wednesday, June 27, the Harveian Oration at the Royal College of Physicians was delivered by Dr. Sieveking. The orator vindicated the claims of Harvey as the true discoverer of the circulation of the blood, the merit of which had been last year publicly ascribed by the Italians to their countryman Andrea Cesalpino.

LIGHTING experiments with gramme machines are being tried daily at the Palais de l'Industrie, in Paris. The area of the building is $2\frac{1}{2}$ acres, the elevation of roof 95 feet. This immense space has been lighted *à giorno*, with two electric lustres each composed of six electric lamps. The motive power required is fifty-horse power, and the results are very satisfactory, although it has not been stated whether they are superior to those of the Alliance system, and Jablochkoff electric candle. The Great Northern Railway Company regularly use electric lamps for their luggage room. The Paris-Lyons Railway is preparing an experiment for the illumination of the whole of the large Paris station. All these experiments are conducted with the intention of testing several electric systems, in order to obtain an immense lighting power for the 1878 international exhibition.

TOWN Councils are seldom noted for either their intelligence or their foresight. We are glad to find, however, there is at least one exception, in the Exeter Town Council, who have decided to postpone the purchase of their town gas-works, "on account of the success of the electric light, and the probability of its superseding gas." This is creditable to the Exeter Councilors, who, we believe, have been the first public body in this country to recognise the value of this latest application of electricity. We hope their expectations will be fulfilled.

A ROMAN correspondent of the *Times*, writing with reference to the shower of sand which occurred at Rome on June 22, sends a translation of the remarks of Father Joseph Lais, published in the *Voce della Verità*:—"The rain of sand continued although to a smaller extent, on the 23rd of June, on which day the heavens were deeply overcast. The sand fell in small perfectly spherical masses of about 1-25,000th of an inch in diameter, at a maxi-

num. It would appear that vesicular vapour, by the action of the wind, had cemented the grains of sand so as to form globules, analogously to what we see on a larger scale in the formation of hail. We are entitled to assert this, seeing the speedy disaggregation of these globules into grains of sand, when brought into contact with a little drop of water in the field of a microscope. The fall on the 22nd was so abundant in Rome that from the amount, 0.25 gramme, gathered on an earthenware disc of 30 centimetres in radius, we argue a fall of not less than eight quintals per square kilometre." The correspondent himself writes: "I am by no means satisfied that the rain was of sand and water. The drops on my drawing paper were easily absorbed by a pocket-handkerchief, and left no stain on the paper; but my drawing still bears many stains from drops which apparently I had not touched. Since then I have washed the sky over with them, and have afterwards sluiced the surface of the paper with water from a sponge; yet there they remain. If sand they be, that material appears to have a most unusually tenacious affinity for the paper. If the drops were of sand and pure water I should expect to find that as soon as the water had evaporated, the sand would no longer adhere to the paper and that the spots would no longer be on my drawing."

THE *Melbourne Argus* informs us that on May 11 the tide rose from five to eight feet on the eastern coast of New Zealand, and that at Sydney and Newcastle, on the New South Wales coast, the tide also rose above its usual height, though in a less marked degree. It will be noted that the great earthquake-wave which did so much damage to the coast towns of Peru occurred on May 10, the time of propagation of the wave from Peru to New Zealand being, however, not yet precisely stated.

SIGNOR GESSI, the celebrated African explorer, while proceeding to the Lake District, had all his scientific instruments and baggage burnt.

MESSRS. MACMILLAN AND CO. have in the press, and will shortly publish, a translation of Fleischer's Volumetric Analysis. In this work the author's aim is to systematise the volumetric processes. A general scheme of analysis without previous separation of bases is also a feature of the work. The translation is made by Mr. Pattison Muir of the Owens College. The translator has added a few notes and supplementary methods.

THE latest news from Yeniseisk announces the passage through this place of MM. Wiggins and Schwanenberg, on their way towards the north. Capt. Wiggins goes towards his steamer, which has wintered at Zureika, and after having taken on board the tallow he proposes to export, he will return, *via* the Kara Sea to England. M. Schwanenberg proposes to undertake an exploration of the graphite mines of the Yeniseisk district, and to take a cargo of graphite to Europe. There is, however, little hope that this latter project will be realised.

WE are glad to learn from the Annual Report of the New Russian (Bessarabian) Society of Naturalists that this young scientific body has displayed during the past year great activity. The following are the more important papers published by the society:—On the family of ephemerides from the standpoint of the Darwinian theory, and on the metamorphoses of axolotls, by Prof. Mechmikoff; the theory of chlorophyll, by Prof. Wolkoff; the algalic fauna of the Black Sea, by M. Rishavy; on the laws of distribution of electricity on surfaces, by Prof. Umoff. The society has, moreover, carried on a considerable number of scientific explorations in various parts of Russia, and has continued the publication of a cryptogamic herbarium of Russia.

THE application of new materials for paper stock which has occupied so much attention of late seems to have attracted some notice in the Philadelphia Exhibition last year. From Jamaica

bamboo was perhaps the most important paper-making plant exhibited. Of the young bamboo stems, which are the best for the purpose, a very large supply, it is said, could be annually, by systematic cuttings or croppings, furnished from plants flourishing in the humid parts of the island. It seems that the American paper manufacturers have also wished to make experiments with bamboo with the view, if possible, of introducing it into the American trade; so that, owing to the proximity of Jamaica to the United States, it is supposed that the supply of bamboo may eventually form an article of trade between the two countries.

THE additions to the Zoological Society's Gardens during the past week include two Pig-tailed Monkeys (*Macacus nemestrinus*) from Java, a Black Leopard (*Felis pardus*) from India, two Argus Pheasants (*Argus giganteus*), a Vieillot's Pheasant (*Euplocamus vieillotti*) from Malacca, presented by Sir Harry St. George Ord, C.B.; a North American Reindeer (*Rangifer tarandus*) from Newfoundland, presented by Capt. Edmund Fraser, 60th Royal Rifles; a Javan Chevrotain (*Tragulus javanicus*) from Java, presented by Mr. William Trent; an African Cobra (*Naja haje*) from the Cape of Good Hope, presented by Mr. Eustace Pillans; a Hawk-headed Parrot (*Derophtus accipitrinus*) from Brazil, purchased; ten Amherst Pheasants (*Thaumalea amherstiae*), two Temminck's Tragopans (*Cerionis temminckii*), twenty Common Boas (*Boa constrictor*), born in the Gardens.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The following gentlemen were, on Saturday, June 30, elected, after open competition, to demysships in Natural Science at Magdalen College:—Mr. J. F. Heyes, of Liverpool College; Mr. R. V. Jackson, of Clifton College; Mr. G. A. Buckmaster, of Christ's Hospital and St. George's Hospital, London; Proxime accessit, Mr. A. M. Jackson, Magdalen College School, unattached student. These demysships are of the value of 95*l.* per annum, and tenable for five years from the date of election.

BRISTOL.—The first session of University College terminated on the 30th ult. without any special ceremony of prize-day or commemoration. The result of the work of this the first year must be considered very satisfactory, for in spite of several serious disadvantages, the lateness of the arrangements and appointments of last autumn, and the inconvenience of the crowded temporary premises, upwards of four hundred students have been enrolled. This number exceeds that of the first year of either the Newcastle or Leeds Colleges of Science, or of the Owens College. Lectures have also been delivered at Stroud in connection with the clothworkers' industry in the departments of textile fabrics and chemistry. Prof. Rowley has also delivered a course of lectures in literature at Bridgewater. Most of the courses of instruction only extended until Easter, when several of the temporary appointments expired. In consequence of this arrangement the numbers attending the classes in the third term has not been so great as in the preceding. The chemical laboratory has been in full swing, and evening practical classes have been added since Easter. The only reappointments hitherto concluded are the professorships of chemistry and modern literature, the lectureship in experimental physics, and the assistant lectureship in chemistry. The other reappointments are held over until the election of a principal, which will take place during the present month. It is understood that there are sixty candidates for this important post. No provision has yet been made for a lectureship in engineering.

ST. ANDREWS.—We understand that Prof. Fischer, the present occupant of the chair of mathematics in the University of St. Andrews, has made application to the University Court of St. Andrews for leave to resign his chair on a retiring allowance. As the necessary arrangements will most probably be completed during the present summer vacation, a new appointment will fall to be made before the opening of the session in the United College in November next. The patronage of the chair belongs to the Crown.